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## TOWARD FURTHER AUTOMATIZATION OF USSR INDUSTRIAL PROCESSES

Considerable progress is anticipated in 1950 toward fulfilling the postwar Stalin Five-Year Plan through the use of new techniques and machines, and automatic control in various branches of industry, transport, and agriculture.

In metallurgy, increasing use is being made of new technological processes for producing cast iron and steel, new methods for processing ore and producing new heat-resistant hard alloys, and new methods of pressure and centrifugal casting. In machine building, greater use is being made of progressive methods of mechanical working of metals: high-speed cutting, mass production of parts and units, electric-spark and anode-mechanical machining methods, etc.

In the stations of the Ministry of Electric Power Stations, more than 70% of all active boilers are fitted with automatic feed regulators, and 35% of the boilers (on the basis of power) are equipped with automatic combustion control. Automatic regulation of excitation is installed on more than 90% of the generators and synchronous compensators (condensers).

The power of hydroelectric units equipped with automatic control has increased to 37% of total installed capacity; the number of completely automatic hydrostations has increased to 38%.

Almost all stations have automatic switching in of reserve station supply, and relay protection for electric motors has been rebuilt to make them self-starting. Much work has been done to speed up activation of relay protection; automatic control and protection of electric transmission lines has been improved. More than 25% of all 110- and 220-kv transmission lines have been fitted with high-speed, highfrequency differential and distance relays. More than half the 35-kv (or over) lines have been equipped with automatic repeated reclosing.

The introduction of automatic equipment on coal pulverizers, deserators, and boiler pumps has also begun on heat networks.

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Automatic control of industrial apparatus is extensively used in the metallurgical industry, especially on electric furnaces where the resultant economy is most noticeable. Automatic electrode control decreases power consumption by 5%, while complete automatization of a large modern steel-smelting furnace gives even better results.

At one metallurgical plant, tests on a 15-ton arc furnace showed that the power consumed per ton of steel smelted was cut by 11% when manual control was replaced by automatic. At present, about 80% of large electric furnaces (capacity 500 kg and over) have automatic electrode control and there is every reason to suppose that all such furnaces will be similarly equipped in the near future.

Automatic control of electric drives is also widely used in the metallurgical industry. Complex automatization of rolling mills has permitted more compact work processes, increased the utilization factor of the main electric drives, and ensured coordinated operation of the auxiliary mechanisms, while at the same time increasing labor productivity, facilitating uninterrupted operations, improving work conditions, and decreasing electric power consumption. For example, complex automatization of a rolling mill in the Magnitogorsk Metallurgical Combine increased its output by 15% and saved 1,400,000 kw-h of power a year. At the same time, quality of pruduction improved and the percentage output of first-class parts increased.

Mention must also be made of the successful introduction of automatic equipment in the Chusovoy Metallurgical Plant, the Plant imeni Dzerzhinskiy, and other enterprises in collaboration with the "Energometallurgprom" Trust and the Central Automatics Laboratory of the Ministry of the Metallurgical Industry.

However, automatic control and regulation are as yet insufficiently utilized. For example, work on automatizing such heavy-duty units as tube rolling mills and wire-drawing machines is quite inadequate. Special attention should also be paid to further automatization in nonferrous metallurgy, where such work can be very effective, especially in regard to cutting specific power consumption. At machine-building plants, automatization of open-hearth and heat-treatment furnaces is of the greatest importance.

In the further development of automatic control of industrial furnaces, it is necessary to intensify work on using electronic and photoelectronic apparatus.

in the metalworking industry, automatic speed regulation is used to maintain optimum machining conditions at an economical cutting speed. Due to the importance of this industry, the latest achievements in this field must be widely disseminated as soon as possible.

Personnel of the Experimental Scientific Research Institute of Metal Cutting Machines, who are carrying out much work on designing and improving electric drives with thyratron converters and electronic control, should render active assistance to industry in the rapid introduction of new automatic systems, including those for assembly lines.

An outstanding example of automatic control is a Moscow plant designed and built by Soviet specialists. All production at this plant is fully automatic, including casting, machining, and checking and sorting of the end product.

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